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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/645,807	08/24/2000	Volker Weinrich	GR 97 P 1861 D	4185
7590 10/16/2003 Lerner and Greenberg PA Post Office Box 2480 Hollywood, FL 33022-2480			EXAMINER AHMED, SHAMIM	
			ART UNIT 1765	PAPER NUMBER

DATE MAILED: 10/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/645,807	WEINRICH ET AL.	
	Examiner	Art Unit	
	Shamim Ahmed	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/110,052.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-14 and 21-22 have been considered but are moot in view of the new ground(s) of rejection and accordingly, the finality of that action is withdrawn

Claim Objections

2. Claims 2 and 6 are objected to because of the following informalities: the phrase "the dry etching " step for the first layer should be rewritten as "the chemical-physical dry etching" because both the chemical or chemical-physical etching are dry etching and which are used to etch the second and first conductive layer, respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.
4. Claims 3 and 7 are rejected under 35 U.S.C. 112; second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. In the claim 3, lines 1-2, the use of a term "the dry etching step" renders the claim indefinite because it is unclear whether the dry etching step is for the first or second conductive layer because both the chemical or chemical-physical etching are dry etching and which are used to etch the second and first conductive layer, respectively.

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6. In the claim 7, line 1, the use of a term "the dry etching step" renders the claim indefinite because it is unclear whether the dry etching step is for the first or second conductive layer because both the chemical or chemical-physical etching are dry etching and which are used to etch the second and first conductive layer, respectively. Appropriate correction is required.

Remarks

In the following rejections, Examiner interprets the dry etching step is for etching the second conductive layer in claim 3 and the dry etching step in claim 7 is for etching the first conductive layer.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-5,7-9,12-14 and 21-22 rejected under 35 U.S.C. 102(e) as being anticipated by Schuele et al (5,930,639).

As to claims 1, 21-22, Schuele et al disclose a process of precision etching of platinum electrodes in a stacked capacitor, wherein a second conductive layer (44) of titanium nitride is formed on a first conductive layer (38) of platinum (col. 8, lines 10- 29 and figure 12).

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Schuele et al inherently teach that the first conductive layer is unetchable to chemical dry etching because the material for the first conductive layer is similar as the instant application (see lines 18-21 at page 15 of the instant application).

Schuele et al also disclose structuring the second conductive layer by etching to form a structured second layer (col.8, lines 50-52 and figure 13).

Schuele et al further disclose that chemical-physical dry etching such as ion milling or RIE is used to etch the first conductive layer using the structured second conductive layer as a mask (col.5, lines 19-23 and col.8, lines 66-col.9, lines 3).

As to claims 2-5, and 7, Schuele et al teach that the dry etching for the first layer comprises a plasma etching such oxygen based reactive ion etching (col. 8, lines 66-col.9, lines 3).

As to claim 3, Schuele et al inherently teach that the reactive substance will react with the second conductive material to form non-volatile compound because the material of the second conductive material is exactly the same as the instant application such as titanium nitride.

As to claim 8-9 and 12-13, Schuele et al teach that applying an insulation layer of silicon oxide (30) on the completed electrode configuration and a contact opening is formed and filling the contact opening by depositing tungsten or aluminum to form a contact plug (col.9, lines 36-40).

As to claim 14, Schuele et al teach that the first conductive layer (38) works as a barrier or etch stop layer during the chemical dry etching of the second layer (44) (col.8, lines 50-58 and see figures 12-13).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schuele et al (5,930,639) as applied to claims 1-5,7-9, 12-14 and 21-22 above, and further in view of Chung (5,976,394).

Schuele et al discussed above in paragraph 8 but remain silent about the dry etching of the first conductive layer comprises an inert gas.

However, Chung teaches that it is conventional to use a reactive gas such as an inert gas (argon) for efficiently etching platinum (col.1, lines 27-40).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Chung's teaching into Schuele et al's method for

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efficiently etching the first conductive layer, which is substantially difficult or substantially unetchable by chemical dry etching without making a reaction product through reaction with platinum as taught by Chung.

12. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuele et al (5,930,639) as applied to claims 1-5,7-9, 12-14 and 21-22 above, and further in view of Yang et al (5,436,190).

Schuele et al discussed above in paragraph 8 but remain silent about the deposition process of silicon oxide, which can be done by TEOS or by a silane process.

However, in a method of fabricating a semiconductor device, Yang et al teach that deposition of silicon oxide is performed by using a TEOS process or by a silane process (col.4, lines 54-67).

Therefore, it would have been obvious to one skill in the art at the time of claimed invention to combine Yang et al's teaching into Schuele et al's process for efficient and easy deposition of silicon oxide as taught by Yang et al.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim et al (6,004,882) disclose an etching process for platinum using a titanium nitride as a mask layer for an improved etching slop and to improve the electrode pattern 9col.2, lines 26-54).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Shamim Ahmed
Examiner
Art Unit 1765

SA
October 8, 2003